KARPOV, V.L.; POMERANTSEV, N.M.; SERGEYEV, N.M.

Nuclear magnetic relaxation in irradiated rubbers. Vysokom. soed. 5 no.1:100-107 Ja '63. (MIRA 16:1)

1. Fiziko-khimicheskiy institut im. L.Ya.Karpova.
(Rubber, Synthetic--Spectra)
(Nuclear magnetic resonance and relaxation)
(Radiation)

L 13334-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/ASD/RPL Ps-4/
Pc-4/Pr-4 RM/WW/BW/MAY/JWD/H

ACCESSION NR: AP3003781 S/0190/63/005/007/0953/0959

78
77

AUTHOR: Leshchenko, S. S.; Karpov, V. L.; Kargin, V. A.

TITLE: Electron-diffraction study of fluorine-containing polymers

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 5, no. 7, 1963, 953-959

TOPIC TAGS: fluorine-containing polymer, fluorine-containing copolymer, electron diffraction, crystalline copolymer, amorphous copolymer, copolymer film, polymer crystalline lattice, rubberlike copolymer, substituent, substituent size, substituent distribution, chlorine substituent, vinylidene fluoride, hexafluoropropylene, chlorotrifluoroethylene

ABSTRACT: The structures of copolymers of vinylidine fluoride and hexafluoropropylene (copolymers I) and of chlorotrifluoroethylene and vinylidene fluoride (copolymers II) have been studied by the electron-diffraction method. The purpose of the study was to determine the effects of the nature of the second monomer, its content, and its distribution along the chain on the crystallization capacity of the polymers. The experiments were conducted with unstretched and stretched films of copolymers I containing 7—35 mol% C_3F_6

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L 13334-63
ACCESSION NR: AP3003781

groups and of copolymers II containing 16.6—66.7 mol% $C_2F_2H_2$ groups. The results of the study, presented in the form of tables and electron diffraction patterns, show that copolymers containing up to 7% C_3F_6 groups in the vinylidine fluoride chain and up to 16% $C_2F_2H_2$ groups in the chlorotrifluoroethylene chain exhibit a crystalline structure identical with that of the respective homolymers. An increase in the content of the second monomer in the copolymers gradually induces disorder in the crystalline lattice. Copolymers I containing over 15% C_3F_6 groups and copolymers II containing over 25% $C_2F_2H_2$ groups are amorphous and exhibit rubberlike properties. The results indicate that the amorphous character of these copolymers is due to the great difference in the size of the substituents (Cl and $-CF_3$ groups) and to an irregular distribution of substituents along the chain. It is concluded that it is possible to convert plastics into polymers with rubberlike properties by the introduction of large and irregularly distributed atoms or groups which upset the regularity of the chain. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 30Oct63 DATE ACQ: 08Aug63 ENCL: 00
SUB CODE: CH NO REF SOV: 003 OTHER: 003

Card 2/2

KARPOV, V.L.; BREGER, A.Kh.; YEROSHOV, M.Ye.; DROZDOV, V.Ye.; LISOV, G.N.; STOYENKO, S.G.; TORGOVITSKIY, D.M.; VAYNSHTEYN, B.I.; SYRKUS, N.P.

Large-scale radiation-chemistry plant with irradiator made from spent nuclear fuels. Atom. energ. 15 no.4:302-308 O '63. (MIRA 16:10)

SERGEYEV, N.M., KARPOV, V.L.

Calculation of the intermolecular second moment of the absorption line of proton resonance in polybutadienes. Zhur.strukt.khim. 5 no. 2:230-235 Mr-Ap '64. (MIRA 17:5)

1. Moskovskiy fiziko-tekhnicheskiy institut i Fiziko-khimicheskiy institut imeni Karpova.

KAPLUNOV, M.Ya.; KHOZAK, V.K.; KOZLOV, V.T.; SOBOLEV, V.S.; TARASOVA, Z.N.; BORISOV, V.A.; KARPOV, V.L.; DOGADKIN, B.A.

Thermoradiation vulcanization of tires. Kauch.i rez. 23 no.11:28-33 N '64. (MIRA 18:4)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti i filial Nauchno-issledovatel'skogo fiziko-khimicheskogo instituta im. L.Ya.Karpova.

ACCESSION NR: AP4017640 S/0190/64/006/002/0310/0313

AUTHORS: Sergeyev, N. M.; Karpov, V. L.

TITLE: Nuclear magnetic resonance spectroscopy of elastomer solutions

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 2, 1964, 310-313

TOPIC TAGS: nuclear magnetic resonance, spectroscopy, proton resonance, elastomer, polyisobutylene, natural rubber, polybutadiene, benzene, spectrometer KIS 25

ABSTRACT: The proton resonance spectra in high resolution (3 to 4 x 10^8) solutions of some elastomers in CCl_4 and benzene have been obtained. The spectrographic records were made on spectrometer KIS-25 at 25 Mc/s proton frequencies. The following specimens were considered: polyisobutylene, natural rubber, polybutadiene SKB, and divinyl rubber. Measurements were made at room temperature, and the chemical shift for the protons was measured with respect to benzene as the internal standard (1-3% relative to CCl_4). For polyisobutylene solutions, a study of the dependence of the CH_3 peak width upon the concentration of the solution showed the width to tend to a limiting value of 5 c/s in the limit of infinite dilution, the

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ACCESSION NR: AP4017640

value apparently being independent of the reduced viscosity. The chemical shift in natural rubber-CCl_4 solution is found to correspond to natural rubber spectra in CS_2 solution. It is shown that the method of nuclear resonance together with the infrared spectra can be used to analyze the contents of 1,2 and 1,4 groups in polybutadiene. Orig. art. has: 3 figures.

ASSOCIATION: Moskovskiy fiziko-tekhnicheskiy institut (Moscow Physicotechnical Institute); Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

SUBMITTED: 26Dec62 DATE ACQ: 23Mar64 ENCL: 00

SUB CODE: NP NO REF SOV: 001 OTHER: 008

Card 2/2

ACCESSION NR: AP4041728 S/0181/64/006/007/2179/2180

AUTHORS: Sergeyev, N. M.; Karpov, V. L.

TITLE: Proton magnetic resonance in gamma-irradiated polyisobutylene

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 2179-2180

TOPIC TAGS: polyisobutylene, gamma radiation, proton nmr, line narrowing, radiation damage

ABSTRACT: The measurements were made with a Trub-Teuber spectrometer (25 Mc/sec) using a non-fractionated polyisobutylene (PIB) sample at room temperature, with exposure in air from the Co^{60} unit of the FKhI (~100 rad/sec). The decrease in the NMR line width with increasing radiation dose turned out to be smaller than expected. A possible explanation is that in spite of the successive destruction of the PIB under the influence of the radiation, the chains still remain intertwined, and the character of segmental motion (microviscosity) remains little changed. Simultaneous high-resolution

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ACCESSION NR: AP4041728

measurements of the spectra of PIB solutions in CCl_4 showed that in highly diluted solutions (~10 mg/cm^3) the NMR line width does not depend strongly on the irradiation, indicating that the line width is not connected directly with the characteristic viscosity, which changes by several orders of magnitude as a result of irradiation. "I am grateful to N. A. Slovokhotova for taking the IR spectra and for many remarks." Orig. art. has: 1 figure and 3 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-khimicheskiy institut im. L. Ya. Karpova, Moscow (Scientific-Research Physicochemical Institute)

SUBMITTED: 24Jan64 ENCL: 01

SUB CODE: SS, OC NR REF SOV: 000 OTHER: 003

ALEKSANDROV, A. Yu.; BERLYANT, S.M.; KARPOV, V.L.; LESHCHENKO, S.S.; OKHLOBYSTIN, O.Yu.; FINKEL', E.E.; SHPINEL', V.S.

Study by the Mössbauer effect of the behavior of dibutyltin dimaleate as stabilizer in the irradiation of polyethylene. Vysokom. soed. 6 no.11:2105-2107 N '64 (MIRA 18:2)

L 64695-65 EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/EWA(h)/EWA(1) GG/RM

ACCESSION NR: AR5012298 UR/0058/65/000/003/D075/D075

SOURCE: Ref. zh. Fizika, Abs. 3D607

AUTHOR: Yegorova, Z. S.; Slovokhotova, N. A.; Leshchenko, S. S.; Karpov, V. L.; Finkel', E. E.; Mitrofanova, L. V.

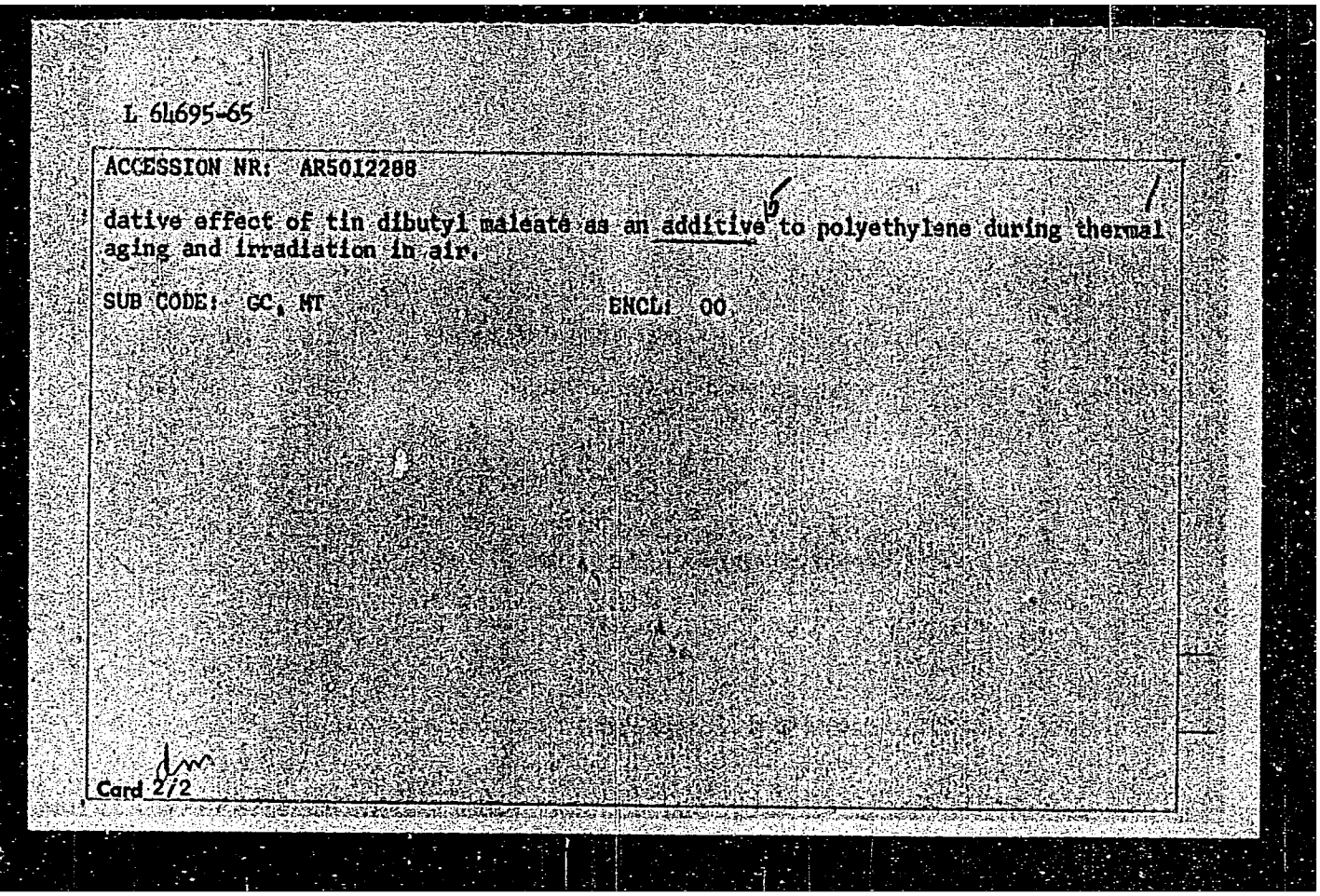
TITLE: Spectral investigation of changes caused by ionizing radiation in polyethylene stabilized by tin dibutyl maleate

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 503-510

TOPIC TAGS: polyethylene, antioxidant additive, spectrographic analysis, ionizing irradiation, ir spectrum

TRANSLATION: It is found that the addition of tin dibutyl maleate reduces the oxidation rate of polyethylene during thermal aging and when it is subjected to ionizing radiation in air. A shift in the carboxyl ion band in the infrared spectrum from 1615 cm^{-1} for untreated polyethylene with tin dibutyl maleate to 1595 cm^{-1} after irradiation in a vacuum indicates that the polymer radical is joined to the tin atom to form a trialkyl tin salt. This is used as a basis to explain the antioxi-

Card 1/2



L 61695-65

ACCESSION NR: AR5012288

dative effect of tin dibutyl maleate as an additive to polyethylene during thermal aging and irradiation in air.

SUB CODE: GC, MT ENCL: 00

Card 2/2

ACCESSION NR: AP4036724 S/0020/64/156/002/0372/0374

AUTHOR: Kurilenko, A. I.; Smetanina, L. B.; Aleksandrova, L. B.; Shiryayeva, G. V.; Karpov, V. L.

TITLE: Modification of the surface properties of grafted polystyrene caprone fibers

SOURCE: AN SSSR. Doklady*, v. 156, no. 2, 1964, 372-374

TOPIC TAGS: polystyrene, caprone fiber, polymer, gamma radiation, polyester, epoxoid, styrol sorption, styrol desorption, fiber resin, resin surface tension

ABSTRACT: The authors studied the effect of polystyrene grafts on caprone fibers using an industrial polyester, PN-1, and epoxoids. The grafting polymerization was initiated by Co^{60} γ-radiation employing a method which first required exposure under vacuum and then was carried out in a gas phase. This process also provided for the development of homopolymers. Four experiments were performed. The results are presented in graphs showing the kinetics of destroyed radicals in caprone fibers, the kinetics of the sorption and desorption of styroles in caprone fibers, the influence of grafted polystyrenes on the wettability of fiber resins, and the influence of grafted polystyrenes on the adhesion of resins to caprone fibers. The surface tension of the resin in each of the experiments was constant and indicated

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Card 2/2

AFANAS'YEV, A.M.; PAVLOV, S.A.; [illegible]

X-ray diffraction study of irradiated polyamides. [illegible]. nauch. mashy no.1:33-36 '65. (MIRA 18:7)

L 23228-66 EWT(m)/EPF(n)-2/EWP(j)/T/EWA(h)/EWA(1) IJP(c) GG/RM

ACC NR: AP6013597 SOURCE CODE: UR/0191/65/000/002/0032/0034

AUTHOR: Afanas'yev, A. M.; Pavlov, S. A.; Karpov, V. L.; Zverev, B. I.

ORG: none

TITLE: Roentgenographic investigation of modified polyamides

SOURCE: Plasticheskiye massy, no. 2, 1965, 32-34

TOPIC TAGS: polyamide, polymer, irradiation resistance, radiation shielding, nuclear shielding, boron, lead, epoxide, polyurethane, chromium compound

ABSTRACT: The modification of polymers with mineral substances has great importance to the preparation of materials resistant to nuclear radiation. Materials are known which are dispersions of compounds of boron and lead in epoxide, polyurethane and silicone bonds which are not inferior to boron and lead in ability to deflect slow neutrons and gamma rays. Coverings based on these dispersions are more effective than covering made from other materials for protection from nuclear radiation. These materials can be used for making special protective clothing, for enclosing x-ray installation, etc. Upon considering the value of the effect caused in mixed polyamide compounds of trivalent chromium, the authors studied the effect of various doses of ionizing radiation on the structure of polyamide AK 50/50 (obtained by the polydensation of AG-salt and ε-caprolactum in a 1:1 ratio) modified with chromium chloride. Radiation was conducted at 20° C in the presence of air on the "K-20000", an installation for radiation-chemical investigations, which has a source of gamma radiation from Co-60 with an activity of 20000 gram-equivalents of Ra. Polyamide S-6 obtained

UDC: 678.675.01:543.422.8

Card 1/2

L 23228-66

ACC NR: AP6013597

on the basis of AG-salt-SG-salt and epsilon-caprolactum in a 1:1:1 ratio, was also used in the study. It was concluded that the introduction of considerable quantities of trivalent chromium salts into a solution of mixed polyamides results in the loss of crystallinity of the film material obtained. The action of gamma radiation up to 200 milliroentgen doses does not cause substantial changes in structure. Further, when the content of the chromium chloride in the polyamide is insignificant its action is expressed in the fixation of the structure formed; when the content is high, it is expressed in the opening of the chains and blocks of macromolecules and in the disturbance of their ordering. Finally, the introduction of glycerine accelerates the loss of crystallinity of the polyamide S-6 during radiation but at a lower rate than the radiation-caused changes of the mechanical and other properties of this polyamide. The structure of polyamides AK 50/50 and S-6, even after addition of a plasticizer, exhibits considerable stability in the action of radiation in the dose range up to 500 milliroentgen dose. Orig. art. has: 2 figures and 3 tables. [JPRS]

SUB CODE: 11, 18 / SUBM DATE: none / ORIG REF: 009

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L 47339-65 EPF(c)/EPF(n)-2/EWG(j)/EWA(h)/EWP(j)/EWT(m)/EWA(1) Pc-4/Pr-4/Pu-4/
Peb GG/RM

ACCESSION NR: AP5009323 S/0191/65/000/004/0052/0055

AUTHORS: Afanas'yev, A. M.; Pavlov, S. A.; Karpov, V. L.; Zverev, B. I.

TITLE: X-ray studies of polyamide films cast from irradiated solutions

SOURCE: Plasticheskiye massy, no. 4, 1965, 52-55

TOPIC TAGS: polyamide, x ray study, irradiation, ordered structure / URS 50 I x ray instrument, K 20000 irradiation device

ABSTRACT: The results of investigating the structures of films after Co^{60} gamma irradiation of initial concentrated solutions of mixed polyamides are described. X-ray analysis was made on a URS-50-I instrument. The test material was prepared from a 27.6% solution of AK 50/50 (1:1 mixture of epsilon caprolactam and hexamethylenediamine adipate) and 80% ethanol and of a similar solution of S-6 (1:1:1 solution of epsilon caprolactam, hexamethylenediamine adipate, and of another hexamethylenediamine compound) and 80% ethanol. The samples were irradiated in an atmosphere of limited air at a temperature of 20°. After irradiating the solutions with integral doses of 0-500 mrd, the concentration was reduced to 10% (dilution, warming, and shaking). The film was poured from the remaining solution at 60° on a glass base also at 60°. The film was then heated to 75°,

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L 47339-65
ACCESSION NR: AP5009323

and x-ray studies were made. The radiation dose for each test, the refraction angle, half-width of peak, and peak intensity are tabulated in the paper. For AK 50/50 the peak half-width and intensity, characterising ordered structure, remained practically unchanged at low doses as compared with nonirradiated solutions. Change became noticeable at doses of 100 mrd, but considerable disordering was found to take place only at 500 mrd. For S-6 the relations proved to be different. Increase in radiation dose to 50-100 mrd was accompanied by increased ordering of the macromolecules in the film, but further increase in radiation dose to 500 mrd caused decrease in the crystalline phase. The authors discuss possible causes of these phenomena as well as some other properties, such as oxidizability, viscosity, and loss of transparency. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: OC, OP

NO REF SOV: 006 OTHER: 004

Card 2/2 CC

L 40994-65 EWT(m)/EPF(c)/EWP(v)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 WW/RM
ACCESSION NR: AP5006567 S/0191/65/000/003/0059/0060

AUTHOR: Shiryayeva, G. V.; Kurilenko, A. I.; Karpov, V. L.

TITLE: Determination of resin adhesion to organic fibers with a diameter of 10-40 microns

SOURCE: Plasticheskiye massy, no. 3, 1965, 59-60

TOPIC TAGS: resin adhesion, adhesive strength determination, dicarboxylic acid ester, organic fiber, shear strength, viscose fiber, hardening agent, polycaprolactam fiber, polypropylene fiber, polyester resin, epoxy resin, polyethyleneglycol ester, phenol copolymer

ABSTRACT: The method of shear developed by Shiryayeva, Andreyevskaya and Gorbatkina (Plastmassy, No 4, 1962; Zhurnal Fizicheskoy Khimii, No 1, 1963) was used in a study of the adhesion, to viscose, kapron, lavsan, and polypropylene fibers, of PN-1 polyester resin (a 67% solution of polyethyleneglycol-maleate-phthalate in styrene) (1), ED-5 epoxy resin (2), and an epoxy-phenol (7:3) copolymer (3). Resin (1) was solidified by adding 3 wt% isopropylbenzene peroxide and 1 wt% of a 10% solution of cobalt naphthenate in styrene with 3-4 hrs. after heating at

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L 40994-65

ACCESSION NR: AP5006567

100C; polyethylenepolyamine, with a 5-hr. after heating at 100C, was used to solidify (2); and (3) was solidified by 18 hrs. heating at 100C. The results, given in a table, indicate that adhesion of (1), (2) and (3) to viscose, kapron, lavsan, and polypropylene fiber decreases in that order, varying from 17.0-39.7 kg/cm^2 for polypropylene to 74.2 ->100 kg/cm^2 for viscose fiber. Orig. art. has: 1 table.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, IE

NO REF SOV: 011 OTHER: 001

Card 2/2

L 45041-65 EWG(j)/EWT(m)/EPF(c)/EWP(j)/EWA(h)/EWA(l) Pc-4/Pr-4/Pab DIAAP
RM

ACCESSION NR: AP5011471 UR/0076/65/039/004/0984/0986

AUTHOR: Lukhovitskiy, V. I.; Tsingister, V. A.; Lagucheva, R. M.; Karpov, V. L.

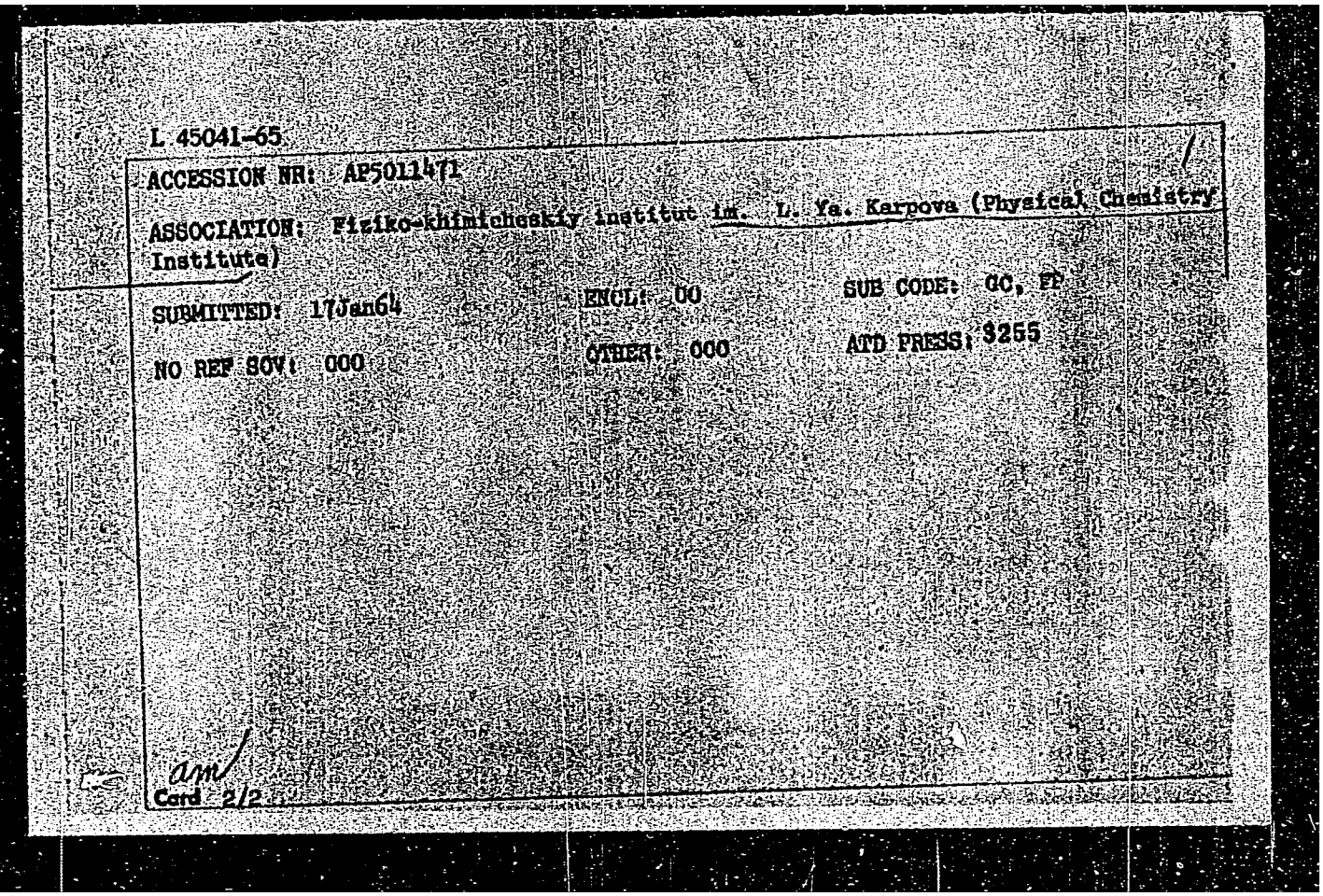
TITLE: Inhibiting action of some solid additives on radiochemical processes

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 4, 1965, 984-986

TOPIC TAGS: radiolysis, heptane, propyl iodide, KU-2 cation exchange resin, ferrous sulfate, free radical, hydrocarbon fuel

ABSTRACT: Samples of heptane containing propyl iodide (0.02—0.05 g equiv/l. l) and 0.25—0.3 g KU-2 ion-exchange resin in the $FeSO_4$ form were irradiated with γ-rays (from a Co source) to study the effect of Fe^{2+} on the radiation yield of free radicals in the radiolysis of heptane. The tabulated results showed that the presence of Fe^{2+} inhibits the formation of free radicals. The inhibiting action of Fe^{2+} decreased as Fe^{2+} oxidized to Fe^{3+}. This heterogeneous inhibition of the homogeneous radiolysis by solid additives containing a transition metal of the lowest valency can not be explained in terms of the existing theories of radiolysis. [No explanation is offered.] Orig. art. has: 1 table. [PS]

Card 1/2



L 45041-65

ACCESSION NR: AP5011471

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physical Chemistry Institute)

SUBMITTED: 17Jan64 ENCL: 00 SUB CODE: GC, FP

NO REF SOV: 000 OTHER: 000 ATD PRESS: 3255

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Card 2/2

L 58477-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/T/EWA(h)/EWA(l) Pc-4/Pr-4/
Peb/Pu-4 GG/RM

ACCESSION NR: AP5014687 UR/0191/65/000/006/0018/0023
678.674.028:621.039.83

AUTHOR: Yegorova, Z. S.; Slovokhotova, N. A.; Karpov, V. L.; Kiselev, B. A.; Bodrova, V. V.

TITLE: Study of processes taking place in the course of radiation-induced hardening of various types of unsaturated condensation resins

SOURCE: Plasticheskiye massy, no. 6, 1965, 18-23

TOPIC TAGS: radiation hardening, unsaturated resin, resin structure, polymer structure, thermal hardening

ABSTRACT: A number of various unsaturated resins were hardened by exposure to radiation from a Co^{60} source. Doses of 0.5—50 Mrad were used. The irradiation was conducted in air. Parallel hardening by thermal treatment was undertaken for comparison purposes. All the resins investigated can be divided into two categories: those which are hardened by relatively small doses of radiation (0.5—8 Mrad), and those which are not. The first category consists of unsaturated polyester resins, such as diethylene glycol maleinate phthalate and polyesters with terminal methacrylate groups, and the second category, of such resins as ethyleneglycol maleinate, epoxy resins, phenol-formaldehyde resin, and epoxy-phenolic resin. The structure of

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L 58477-65

ACCESSION NR: AP5014687

the hardened samples was studied by observing their infrared absorption spectra. Conclusions made were based on measurements of IR bands associated with carbon—carbon double bonds, enecne groups, ether and ester functions, carbonyl, and other groups. It was found that unsaturated polyester resins harden most easily under the influence of radiation. Both thermal and radiation-induced hardening of unsaturated polyester resins depend on the reaction of double bonds in the resin. While irradiation of the phenol-formaldehyde resin (novolac type) solution in furfurol involves a reaction of furfurol with the diene function of the resin, thermal hardening of the same resin probably depends on the reaction of furfurol with carbonyl groups and concurrent polymerization of furfurol. Orig. art. has: 7 figures. [VS]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, NP

NO REF SOV: 004 OTHER: 007 ATD PRESS: 4019

Card 2/2

L 58360-65 EWG(j)/EPA(e)-2/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/T/EWA(h)/EWA(l)
Pc-4/Pr-4/Ps-4/Pt-7/Peb/Pu-4 WW/GG/RM

ACCESSION NR: AP5018038 UR/0191/65/000/007/0035/0038
678.06-419:677.521:621.039.83

AUTHOR: Kiselev, B. A.; Yegorova, Z. S.; Karpov, V. L.; Bodrova, V. V.; Porokhov, V. S.

TITLE: Use of irradiation to improve glass-reinforced plastics

SOURCE: Plasticheskiye massy, no. 7, 1965, 35-38

TOPIC TAGS: glass reinforced plastic, property improvement, irradiation, gamma radiation

ABSTRACT: The feasibility of substituting α-irradiation for heat treatment in order to improve the mechanical properties of very thick glass-reinforced plastics (GRP) has been studied because heat treatment sometimes causes undesirable side effects. GRP based on the following binders were irradiated with small doses (up to 100 Mrad): EP-32-301 (epoxy-phenol type), FN (phenol-furfural-formaldehyde type), VFT-S (phenol-formaldehyde + polyvinyl butyral + an organosilicon monomer [unspecified]), and SK-193 (epoxy + an organosilicon monomer). The effect was determined of the α-irradiation on various mechanical and physical properties whose improvement is desirable, such as tensile strength, modulus of elasticity, and, in some cases, softening point.

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L 58360-65

ACCESSION NR: AP5018038

It was found that irradiation with small doses improves the physical and mechanical properties of GRP based on binders containing double bonds or epoxy groups. On the other hand, such irradiation impaired the properties of GRP based on modified phenol-formaldehyde and organosilicon binders which contain no double bonds or epoxy groups. Orig. art. has: 5 tables and 6 figures. [SM]

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, NP

NO REF SOV: 001 OTHER: 000 ATD PRESS: 4047

Card 2/2

L 62478-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/T/EWA(h)/EWA(1) GS/RM

ACCESSION NR: AP5020972 UR/0190/65/007/008/1427/1429
678.01:53

AUTHOR: Savin, A. G.; Vaysberg, S. E.; Karpov, V. L.; Tikhomirova, N. S.

TITLE: Gas diffusion in polymers subjected to ionizing radiation

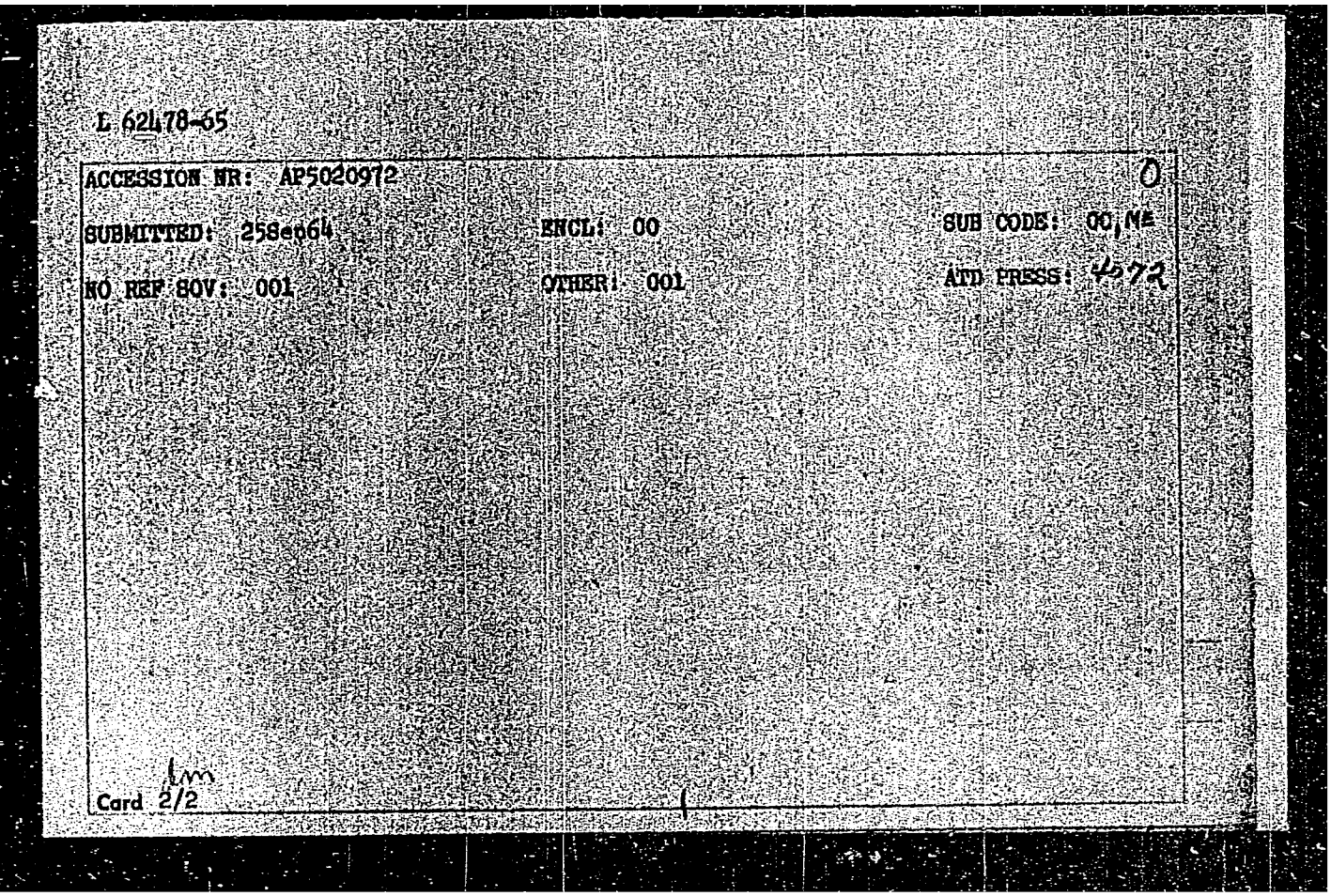
SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 8, 1965, 1427-1429

TOPIC TAGS: gas diffusion, polymer, polyethylene, ionizing radiation

ABSTRACT: A study has shown that gas diffusion through polymers is not accelerated by irradiation. This finding is in contrast to the results of Tikhomirova, Malinskiy, and Karpov (Vysokomolekulyarnyye soyedineniya, 2, 1960, 1349) which are attributed to trivial effects in the absence of a control experiment. The study involved the diffusion of argon, helium, and nitrogen in polyethylene which was being irradiated with ionizing radiation (γ-rays from a Co^{60} source or 300-kev electrons) at 0 and 17—19C at dose rates from 400 to 10,000 rad/sec. Orig. art. has: 1 table and 3 figures. [SM]

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute)

Card 1/2



L 62478-65

ACCESSION NR: AP5020972 0

SUBMITTED: 25Dec64 ENCL: 00 SUB CODE: 00, NE

NO REF SOV: 001 OTHER: 001 ATD PRESS: 4272

Card 2/2

YE[illegible]OVA, L.S.; SI[illegible]KHOTOVA, N.A.; KARPOV, V.L.; KISELEV, R.A.; [illegible]OVA, V.V.

Studying the processes taking place during the radiation hardening of the various types of unsaturated condensation resins. Plast.massy no.6:28-29 '65. (MIRA 18:8)

L 00747-66 EPF(c)/EWT(m)/EWP(j)/T/EWA(h)/EWA(l) RPL RM/WW

ACCESSION NR: AP5020964 UR/0190/65/007/008/1319/1322

AUTHOR: Karpov, V. L.; Leshchenko, S. S.; Mitrofanova, L. V.; Finkel', E. E.

TITLE: Characteristics of the radiation crosslinkage of certain polyolefins and their copolymers in a nitrous oxide medium

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 8, 1965, 1319-1322

TOPIC TAGS: polyolefin, polyethylene, polypropylene, copolymer, nitrogen compound, crosslink, radiation effect

ABSTRACT: The effect of nitrous oxide on the radiation crosslinkage of polyethylene, polypropylene and an ethylene-propylene copolymer was investigated by the extraction method. It was shown that nitrous oxide accelerates this process in comparison to radiation crosslinkage attained in vacuum. The greatest acceleration was noted in polypropylene, from which it was concluded that the increased radiation crosslinkage yield is associated with the suppression of degradation. The acceleration effect in polyethylene was smaller since the prevailing process, upon its irradiation, is crosslinking and not degradation. It was suggested that

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L 00747-66
ACCESSION NR: AP5020964

6

the mechanism of energy dissipation from polyisobutylene to nitrous oxide, proposed by J. Okada (J. Appl. Polymer Sci. 7, 1731, 1963), obtains for the other polyolefins. Orig. art. has: 4 figures

44,55

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute) Nauchno-issledovatel'skiy institut kabel'noy promyshlennosti (Scientific Research Institute of the Cable Industry)

44,55

SUBMITTED: 22Aug64 ENCL: 00 SUB CODE: GC, NP

NR REF SOV: 005 OTHER: 000

Card 2/2

KURILENKO, A.I.; TATARENKO, O.F.; KARPOV, V.L.

Determination of the dynamic elasticity constants of polymeric materials in the field of action of γ-rays and fast electrons. Vysokom. soed. 7 no.8:1422-1426 Ag '65. (MIRA 18:9)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova AN SSSR, Moskva.

SAVIN, A.G.; VAYSBERG, S.E.; KARPOV, V.L.; TIKHOMIROVA, N.S.

Diffusion of gases in polymers being subjected to ionizing radiation. Vysokom. soed. 7 no.8:1427-1429 Ag '65. (MIRA 18:9)

1. Fiziko-khimicheskiy institut imeni L.Ya.Karpova [illegible], Moskva.

L 8870-66 EWT(m)/EPF(n)-2/EWP(v)/EWP(j)/T/EWA(h)/EWA(l) WW/GG/RM

ACC NR: AP5025959 SOURCE CODE: UR/0190/65/007/010/1707/1712

AUTHOR: Kurilenko, A. I.; Shiryayeva, G. V.; Karpov, V. L.

ORG: Branch of the Physicochemical Institute im. L. Ya. Karpov (Filial Fiziko-khimicheskogo instituta)

TITLE: Investigation of adhesion of radiation-hardened polyester resins onto highly oriented organic fibers

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 10, 1965, 1707-1712

TOPIC TAGS: polyester resin, synthetic fiber, adhesion, radiation polymerization

ABSTRACT: The adhesion between radiation-hardened polyester resins MGF-9, TMGF-11 and PN-1 and highly oriented viscose, lavsan, caprone and polypropylene fibers was investigated to ascertain bonding characteristics of polyester resins to polymeric fibers. Based on studies with MGF-9 and caprone, a change in gamma-radiation intensity from 65 to 580 roentgen/sec has practically no effect on adhesion. Increase in radiation dose to 10 Mrad increased the bond strength between the resin and fiber while further increase to 60 Mrad had practically no effect

Card 1/2 UDC: 678.01:53+678.674

L 8870-65

ACC NR: AP5025959

15

on adhesive strength. The magnitude of adhesion to the different resins decreases in the following order: viscose, lavsan, caprone, polypropylene; the adhesion between the latter and a given resin is about half of that between viscose and the resin. This dependence is qualitatively the same if the resin is hardened thermally or by radiation. The somewhat reduced adhesion between MGF-9 and caprone produced by radiation hardening in comparison to thermal hardening was attributed to changes in thesurface properties of the caprone fiber ocused by radiation. "Ye. V. Starodubtseva participated in the experimental work. Measurements of physical properties of MGF-9 resin were conducted by O. P. Tatarenko and I. G. Nikulina. The authors thank I. A. Suskin and V. G. Medyannikov for participation in conducting the experiments." Orig. art. has: 2 figures and 3 tables.

SUB CODE: MT/ SUBM DATE: 09Nov64/ ORIG REF: 006/ OTH REF: 001

44,55 44,55 44,55 44,55

SC

Card 2/2

KURILENKO, A.I.; SMETANINA, L.V.; ALEKSANDROVA, L.B.; KARPOV, V.L.

Graft polymerization of styrene on capron and lavsan fibers. Vysokom. soed. 7 no.11:1935-1940 N '65. (MIRA 19:1)

1. Filial fiziko-khimicheskogo instituta imeni L.Ya. Karpova. Submitted December 19, 1964.

L 2265-66 EWT(m)/EPF(c)/EPF(n)-2/EWP(j)/EWA(h)/EWA(l) GG/RM

ACCESSION NR: AP5022220 UR/0191/65/000/009/0008/0012
678.742.2.01:539.12.04:678.048

AUTHOR: Gladkova, G. I.; Yegorova, Z. S.; Karpov, V. L.; Leshchenko, S. S.; Mitrofanova, L. V.; Slovokhotova, N. A.; Finkel', E. E.; Cherntsov, S. M.

TITLE: Thermal stabilization of irradiated polyethylene by industrial antioxidants

SOURCE: Plasticheskiye massy, no. 9, 1965, 8-12

TOPIC TAGS: antioxidant additive, polyethylene, antirad additive, gamma radiation, radiation effect

ABSTRACT: The following industrial antioxidants were introduced into polyethylene in amounts of 2, 5, and 10%: 2,2'-methylenebis(4-methyl-6-tert-butylphenol); 4,4'-methylenebis(2-methyl-6-tert-butylphenol); 2,2'-methylenebis(4-ethyl-6-tert-butylphenol); N-isopropyl-N'-phenyl-p-phenylenediamine (nonox ZA); 4,4'-thiobis (6-tert-butyl-m-cresol); 4,4'-thiobis(2-tert-butyl-m-cresol); phosphite of P-24 (P-24 being a phenol-styrene condensation product); and di-β-naphthyl-p-phenylenediamine. The polyethylene samples were then irradiated, kept in air thermostated at 150 and 200C for various periods of time, and tested for relative elongation and tensile strength. The compounds were found to have a stabilizing effect if

Card 1/2

L 2265-66
ACCESSION NR: AP5022220

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their content is 10 to 20 times the amount introduced into polyolefins to protect the latter from oxidation during processing. The most effective antiradiation additives kept the elongation of polyethylene irradiated with Co^{60} gamma rays at 300-350%. Infrared analysis showed that during irradiation, particularly in the course of thermal aging, the stabilizer concentration in polyethylene decreases markedly. It is found that irradiation not only causes the formation of trans-vinylene unsaturation, but also gives rise to systems of conjugated double bonds whose number increases substantially during thermal aging. Carbonyl groups are formed both during irradiation and thermal aging, but in much smaller quantities than in cable polyethylene. "The authors thank G. Ya. Richmond for supplying the antioxidant samples." Orig. art. has: 7 figures. 4455

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 005 OTHER: 005

Card 2/2

LUKHOVITSKIY, V.I.; TSINGISTER, V.A.; LAGUCHEVA, E.M.; KAZION, V.L.

Inhibiting effect of certain solid additions on the radiation-chemical processes. Zhur. fiz. khim. 39 no.4:984-986 Ap '65. (MIRA 19:1)

1. Fiziko-khimicheskiy institut imeni Karpova. Submitted Jan. 17, 1964.

L 24807-66 EWT(m)/EPF(n)-2/EWP(j)/T/EWA(h)/ETC(m)-6/EWA(l) IJP(c) WW/GG/RM

ACC NR: AP6012722 (A) SOURCE CODE: UR/0190/66/008/004/0744/0748

AUTHOR: Veselovskiy, P. A.; Leshchenko, S. S.; Karpov, V. L.

ORG: Physicochemical Scientific-Research Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: Thermal degradation of irradiated polypropylene

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 4, 1966, 744-748

TOPIC TAGS: pyrolysis, irradiation, polypropylene, molecular structure, chain polymer, gel

ABSTRACT: Changes in the structure of irradiated polypropylene have been studied by pyrolysis. Polypropylene chains were found to contain active groups which appear to be oxygen-containing groups of various structure. The increase in gas formation at the initial stage of pyrolysis for nonirradiated polypropylene is caused by the presence of the active oxygen-containing groups; and for the polypropylene, irradiated up to the gel-formation dose, it is caused by the presence of branching points in the chain. The active (oxygen-containing) groups are spent with the irradiation of polypropylene. Since the polypropylene chains irradiated below the dose for the initial stage of gel-formation have few branchings, a drop in the characteristic viscosity in polypropylene irradiated with small doses is caused mainly by degradation of the molecular chains. Cross-linking of the polypropylene chains is inhibited by

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L 24807-66

ACC NR: AP6012722

the presence of active (oxygen-containing) groups in them. Atactic polypropylene is found to be a stereoregular branched polymer. The rate of degradation of cross-linked polypropylene is higher than that of linear polypropylene. Orig. art. has: 6 figures and 4 formulas. [AM]

SUB CODE: 07/ SUBM DATE: 07May65/ ORIG REF: 003/ OTH REF: 010/

Card 2/2

L 23921-66 EWT(m)/EPF(n)-2/EWP(j)/T/EWA(h)/EWA(l) IJP(c) GG/RM

ACC NR: AP6010428 (A) SOURCE CODE: UR/0020/66/167/002/0339/0341

AUTHOR: Veselovskiy, R. A.; Leshchenko, S. S.; Karpov, V. L. 31

ORG: Physicochemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut) B

TITLE: Some aspects of the radiation chemistry of polypropylene 15

SOURCE: AN SSSR. Doklady, v. 167, no. 2, 1966, 339-341

TOPIC TAGS: polypropylene, gamma irradiation, irradiation effect

ABSTRACT: Structural changes occurring in isotactic polypropylene (intrinsic viscosity of 5.3) under the influence of Co^{60} gamma irradiation were studied. The contribution of radical and ionic reactions to the cross-linking process was found to be negligible, presumably because the side methyl groups cause steric hindrance effects which do not permit the polyprolylene chain to come sufficiently close to one another. Vinylidene-type double bonds were found to be responsible for the formation of cross-linkages in polypropylene. The cross-linking is thought to result from the interaction between an excited double bond and the polymer chain, and the energy required for the excitation must be propagated along this chain. The rate of formation of vinylidene groups, determined by IR spectrometry, is much faster below the gelation dose (6.5 Mrad) than above it; this is explained by a higher rate of consumption of vinylidene groups after the gelation dose. The consumption of active oxygen-containing

UDC: 678.742.3:660.85

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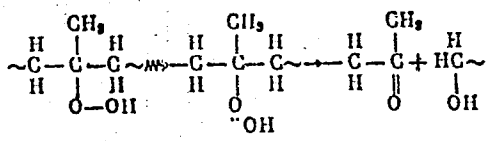
L 23921-66

ACC NR: AP6010428

groups may be governed by the following mechanism:



Thus, the decomposition of these groups follows a radial mechanism followed by the rupture of the main polymer chain. Introduction of radial acceptors into the polymer prevents such ruptures and thus shifts the start of gelation toward lower doses. The paper was presented by Academician V. A. Kargin on 26 June 1965. Orig. art. has: 2 figures, 1 formula.

SUB CODE: 07/ SUBM DATE: 14Jun65/ ORIG REF: 003/ OTH REF: 009

Card 2/2

L 27310-66 EWT(m)/EPF(n)-2/EWP(j) IJP(c) WW/GG/RM

ACC NR: AP6008977 (A) SOURCE CODE: UR/0190/65/007/011/1935/1940

AUTHORS: Kurilenko, A. I.; Smetanina, L. V.; Aleksandrova, L. B.; Karpov, V. L.

ORG: Branch of the Physico-Chemical Institute im. L. Ya. Karpov (Filial fiziko-khimicheskogo instituta)

TITLE: Graft polymerization of styrene on caprone and lavsan fibers /First communication in the series "Modification of properties of highly oriented fibers by graft polymerization of vinyl monomers"/

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1935-1940

TOPIC TAGS: caprone, radiation polymerization, graft copolymer, polymerization

ABSTRACT: It was the object of the investigation to extend the work published by A. I. Kurilenko, L. B. Smetanina, L. B. Aleksandrova, G. V. Shiryayeva, and V. L. Karpov (Dokl. AN SSSR, 156, 372, 1964) and to study the graft polymerization of styrene on caprone and lavsan fibers. The polymerization was initiated by a preliminary irradiation of the fibers in vacuum by Co^{60} γ-radiation and subsequent exposure of the fibers to the monomer vapors or by direct irradiation of the fibers in the monomer vapor. The experimental results are represented in terms of the fractional weight increase of the fibers

$$\Delta P = \frac{P - P_0}{P_0} \cdot 100\%,$$

Card 1/2 UDC: 66.095.26+678.674+678.675+678.746

L 27310-66

ACC NR: AP6008977

P_o and P--the weight of specimen before and after graft polymerization. The kinetics of monomer sorption and disappearance of free radicals was studied. The experimental results are presented graphically (see Fig. 1).

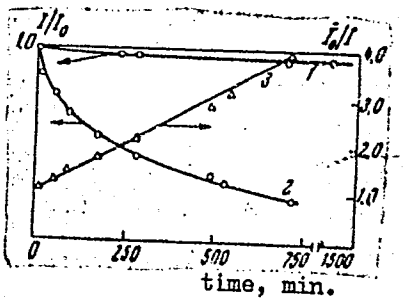


Fig. 1. Kinetics of radical disappearance in caprone fibers. Fibers irradiated with 2.7 Mrad, intensity of radiation - 150 rad/sec, temperature 26C. 1 - epr signal intensity of irradiated fibers in the absence of styrene; 2 - in the presence of styrene; 3 - same as 2 but plotted in reciprocal coordinates.

It is concluded that the rate of styrene graft polymerization is controlled by the diffusion of styrene to the free radicals on the fibers. The grafting of styrene onto the fibers changes the mechanical properties of the latter. Orig. art. has: 2 tables, 3 graphs, and 1 equation.

SUB CODE: 11/ SUBM DATE: 19Dec64/ ORIG REF: 005/ OTH REF: 002

Card 2/2

ACC NR: AP6033274 SOURCE CODE: UR/0020/66/170/004/0868/0871

AUTHOR: Bakayeva, V. P.; Yegorova, Z. S.; Karpov, V. L.

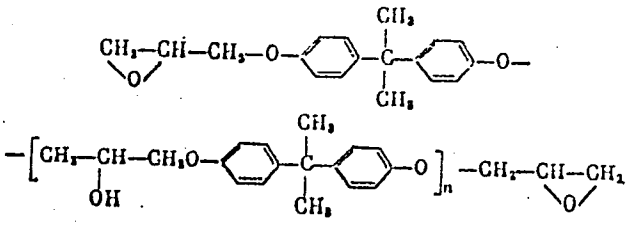
ORG: Institute of Physical Chemistry im. L. Ya. Karpov (Fiziko-khimicheskiy institut)

TITLE: The effect of ionizing radiation on epoxy resins

SOURCE: AN SSSR. Doklady, v. 170, no. 4, 1966, 868-871

TOPIC TAGS: ionizing radiation, epoxy plastic, mass spectrometry, electron paramagnetic resonance, isomerization

ABSTRACT: The authors study molecular variations which occur during irradiation of epoxy resins. Solid epoxy resins and resins synthesized from epichlorohydrin and diphenylenepropane with a molecular weight of 1000 and an epoxy number of 9-12 are studied. The structure of resins of this type is as follows:



where n=0-15

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UDC: 547.914

ACC NR: AP6033274

Powdered resin specimens were irradiated both in air and in a vacuum at room temperatures by a stream of fast electrons with an energy of 200 kev and a current density of 0.0143 ma/cm^2, and by Co^{60} gamma rays. The radiation doses varied from 20 to 1500 Mrad. The following methods were used: infrared spectroscopy, mass-spectrometric analysis, thermomechanical analysis and solubility in acetone. The results of these studies show that breaking of epoxy rings, cross linking and destruction occur during ionizing radiation. Cross linking can be explained by the fact that hydrogen atoms break away from methyl groups to form radicals. This is verified by triplet formation observed in electron paramagnetic resonance spectra during irradiation of diphenylenepropane and epoxy resin. Orig. art. has: 4 figures, 1 table, 4 formulas.

SUB CODE: 07/ SUBM DATE: 09Dec65/ ORIG REF: 006/ OTH REF: 003

Card 2/2

L 06456-67 EWT(m)/EWP(j) IJP(c) GG/RM

ACC NR: AP6024546 (A) SOURCE CODE: UR/0089/66/021/001/0064/0066

AUTHOR: Berlyant, S. M.; Drozdov, V. Ye.; Finkel', E. E.; Orlenko, P. A.; Suroyegin, L. M.; Breger, A. Kh.; Karpov, V. L.; Zorin, V. A.

ORG: none

TITLE: Large-scale radiation cross linking of polyethylene insulation of cable products

SOURCE: Atomnaya energiya, v. 21, no. 1, 1966, 64-66

TOPIC TAGS: radiation chemistry, polyethylene, polymer cross linking, insulated wire, electric cable/ KP gamma ray apparatus

ABSTRACT: In view of the many advantages resulting from the use of irradiated thermally stabilized polyethylene as insulation in cables, the authors describe apparatus developed for the irradiation of such insulation, for use in geophysical cables for very deep well drilling (o.d. 6.5 mm, length ~9 km, weight ~380 kg, volume ~ 400 l), capable of withstanding temperatures up to 200C and pressures higher than 300 atm. The entire cable was wound on a drum and exposed to γ radiation from Co^{60} (total activity 180,000 g-equivalent of radium) from the KP-200 apparatus. Measures taken to ensure uniformity of the gamma radiation, which is an essential factor in the success of the operation, are described. The required dose was 140 Mrad (±10%). At a dose intensity of 63 r/sec and an irradiation time of 610 hr, the productivity of the apparatus was 0.7 kg/hr and the efficiency ~13%. The authors thank G. N. Lisov

Card 1/2 UDC: 621.039.55: 541.15

L 06156-67

ACC NR: AP6024546

for participating in the development of the apparatus, and M. Ye. Yeroshov, M. D. Larionov, L. K. Topil'skiy, Yu. D. Kozlov, and the late N. A. Kuznetsov for help with the experiments. Orig. art. has: 3 figures.

SUB CODE: 07, 20/ SUBM DATE: 16Oct65/ ORIG REF: 007

Card 2/2

KARPOV, V.M.

Improving the planning of track overhauling. Put' i put.khoz. 7 no.1: 47 '63. (MIRA 16:3)

1. Nachal'nik putevoy mashinnoy stantsii No.49, stantsiya Burovka, Kuybyshevskoy dorogi.
(Railroads—Maintenance and repair)

KARPOV, V. M.

Increasing the operative efficiency of machinery. Put' i put. khoz. 6 no.9:11-12 '62. (MIRA 15:10)

1. Nachal'nik putevoy mashinnoy stantsii No. 49, st. Yelshanka, Kuybyshevskoy dorogi.

(Railroads—Maintenance and repair)

SHEIN, D.V., inzh.; KARPOV, V.M., inzh.; POLYANIN, M.A., inzh.

At mining enterprises of eastern Kazakhstan. Bezop. truda v prom. 8 no.9:30-31 S '64 (MIRA 18:1)

1. Upravleniye Vostochno-Kazakhstanskogo okruga Gosudarstvennogo komiteta pri Sovete Ministrov Kazakhskoy SSR po nadzoru za bezopasnym vedeniyem rabot v promyshlennosti i gornomu nadzoru.

POLYAKOV, V.N.; KARPOV, V.M.

Effective use of 56-125T bits. Neft. khoz. 36 no.5:19-22 My '58.
(MIRA 11:6)

(Oil well drilling rigs)

METELITSA, Z.I.; KARPOV, V.M.

Efficiency promoters of the Office of the Work Supervisor No. 395. Biul.tekh.inform. 5 no.2:27 F '59. (MIRA 12:4)
(Leningrad--Efficiency, Industrial)

KARPOV, V.M.

Local infestation by Diphyllobothrium in Dzerzhinsk. Med.paraz. i paraz.bol.supplement to no.1:66 '57. (MIRA 11:1)

1. Iz parazitologicheskogo otdela sanitarno-epidemiologicheskoy stantsii Dzerzhinska Gor'kovskoy oblasti.
(DZERZHINSK--TAPEWORMS)

S/032/60/026/011/030/033
B004/B067

AUTHOR: Karpov, V. M.

TITLE: Device for Controlling the Thickness of Materials by Means of Radioactive Preparations

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 11, pp. 1312 - 1316

TEXT: On the basis of the theoretical explanations given in the introduction a ПРК-1 (PRK-1) apparatus was developed for controlling the wall thicknesses by means of Eu^{152} Tu^{170} Sr^{90}. The principle consists in the electronic amplification of the scintillation detector signal with a transformer being used to attain the necessary amperage. A special device was constructed for measuring the wall thicknesses of thin bimetal pipes (Fig. 6) with which the Sr^{90} containing ampoule may be accurately centered. 1 - Radiation source in the ampoule 2, attached to the core 3, the thrust antifriction bearings 6 with fluoroplast rings are attached to the pin 4,5 of the co... Pipe 7 (sample) slides along the guide slot 8,

Card 1/2

KARPOV, V.M.

Fatigue characteristics of an electron photomultiplier operating under average current conditions. Zav.lab. 28 no.10:1256-1257 '62. (MIRA 15:10)

1. Moskovskoye vyssheye tekhnicheskoye unchilishche imeni Baumana.
(Photoelectric multipliers--Testing)

ACCESSION NR: AT4045009 S/0000/64/000/000/0057/0059

AUTHOR: Karpov, V. M.; Litvinenko, V. N.; Chizh, V. A.

TITLE: Checking extremely thin-walled tubes by means of radioactive isotopes

SOURCE: Soveshchaniye po probleme Izpol'zovaniye atomnoy energii. Kiev, 1961. Radiatsionnaya avtomatika, Izotopy* i yaderny*ye izlucheniya v nauke i tekhnike (Radiation automation control systems, isotopes, and nuclear radiation in science and technology); doklady* soveshchaniya. Kiev, Izd-vo AN UkrSSR, 1964, 57-59

TOPIC TAGS: thickness measurement, measuring device, radioactive measurement, pipe manufacture, thin walled tube, radioscopy, direct radioscopy

ABSTRACT: The three principal ways to measure the wall thickness of a tube by means of radioactive isotopes are illustrated schematically in Fig. 1 of the Enclosure. The chord method suffers from two deficiencies: the need for a rigidly fixed and extremely thin radiation beam. The reflected radiation method is less sensitive than the direct radioscopy method and, moreover, the saturation thickness is comparatively small. For Sr^{90}, for example, the range measurable by the former method is only 0.1-15 mm. Large thicknesses are most conveniently checked by direct radioscopy. The remainder of the present paper is devoted to a description of a direct radioscopy device for wall-thickness measurements. A special electromag-

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ACCESSION NR: AT4045009

netic unit for contactless mounting and orientation of the radioactive source inside the tube had to be worked out in this connection and is described in detail. With this device, the scatter of thickness measurements is only 3-5 μ and the absolute accuracy can reach 5-8 μ. Orig. art. has: 3 figures and 1 formula.

ASSOCIATION: none

SUBMITTED: 07Jan64 ENCL: 01 SUB CODE: IE, NP

NO REF SOV: 000 OTHER: 000

Card 2/3

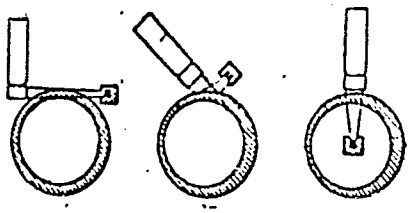

Fig. 1. Techniques of measuring tube wall thickness and its variations: a) from the chord; b) from the intensity of the reflected radiation; c) by direct radioscopy.

Card 3/3

KARPOV, V.M.; KLYUYEV, V.V.

Measuring vibrations by means of eddy currents. Priborostroenie no.9:4-6 S '64. (MIRA 17:1)

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ACCESSION NR: AP4045915 S/0119/64/000/009/0004/0006

AUTHOR: Karpov, V. M. (Candidate of technical sciences); Klyuyev, V. V. (Engineer)

TITLE: Vibration measurement by eddy currents

SOURCE: Priborostroyeniye, no. 9, 1964, 4-6

TOPIC TAGS: vibration, vibration measurement, vibrometer / TVV-1 vibrometer

ABSTRACT: The TVV-1 vibrometer can measure vibrations with amplitudes of 1 micron — 1 mm and frequencies between 20 cps and 10 kc. The sensor, consisting of a parallel tuned circuit, is placed at 3—5 mm to the vibrating surface; deviation of the sensor axis by as much as 20° from the normal to the test surface introduces only a negligible error. The sensor's r-f signal is diode-detected, amplified, and applied to an amplitude voltmeter. An r-f oscillator, a frequency meter, a calibration unit, and a power-supply unit complete the

Card 1/2

ACCESSION NR: AP4045915

instrument. A simplified circuit diagram of the instrument, design features of the sensor, and the method of calibrating the instrument are given. Orig. art. has: 4 figures.

ASSOCIATION: MVTU im. Baumana (Moscow School of Higher Technical Learning)

SUBMITTED: 00 ENCL: 00

SUB CODE: IE NO REF SOV: 004 OTHER: 001

Card 2/2

DALMATOV, B.I. (Leningrad); KARPOV, V.M. (Leningrad)

Depth for laying foundations in districts of deep seasonal freezing. Osn., fund. i mekh. grun. 3 no.4:3-5 '61. (MIRA 14:8)
(Foundations) (Frozen ground)

KARPOV, V.M.

Investigation of the moisture cycle of soils around foundations of buildings in districts subject to deep seasonal freezing. Stroi. v raion. Vost.Sib. i Krain.Sev. no.3:146-153 '62.

(MIRA 17:12)

KARPOV, V.M., inzh.

Study of frost heave of soils incompletely saturated with water.
Sbor. nauch. trud. LISI no.37:42-55 '62. (MIRA 16:3)
(Frozen ground) (Soil moisture)

DALMATOV, B.I.; KARPOV, V.M.

Stability of foundations in clayey soils during deep seasonal freezing. Osn., fund. i mekh. grun. 5 no.4:4-7 '63. (MIRA 16:11)

KARPOV, V.N.

5
19

AID Nr. 990-6 14 June

SCIENTIFIC-TECHNICAL CONFERENCE ON MODERN GYROSCOPE TECHNOLOGY (USSR)

Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, v. 6, no. 2, 1963, 156-158. S/146/63/006/002/010/010

The Fourth Conference on Gyroscope Technology, sponsored by the Ministry of Higher and Secondary Special Education RSFSR, was held at the Leningrad Institute of Precision Mechanics and Optics from 20 to 24 November 1962. The conference was attended by representatives from 93 organizations in 30 S[illegible] cities, including educational establishments, scientific research institutes, design bureaus, and industrial concerns. The following are some of the topics covered in the 92 papers presented and discussed at the conference. Vibrations of a gyroscope pendulum with a movable suspension in a nonuniform gravitational field: M. Z. Litvin-Sedoy, Senior Scientific Worker; improving dynamic characteristics of some gyro instruments and devices: A. V. Reprikov, Docent, Candidate of Technical Sciences; some problems of the dynamics of a gyroscope with an electric drive installed in a gymbol suspension: S. A.

Card 1/3

AID Nr. 990-6 14 June

13

SCIENTIFIC-TECHNICAL CONFERENCE [Cont'd] S/146/63/006/002/010/010

Kharlamov, Engineer; problems of the theory of the inertial method for measuring aircraft acceleration: I. I. Pomykayev, Docent, Candidate of Technical Sciences; determining the drift of a floated-type integrating gyroscope without the use of a dynamic stand: G. A. Slomyanskiy, Docent, Candidate of Technical Sciences; natural damping of nutational vibrations of a gyroscope: N. V. Gusev, Engineer; motion of a not quite symmetrical gyroscope pendulum with vertically movable support: A. N. Borisova, Aspirant; gyroscope-type inclinometer for surveying vertical freezing wells: V. A. Sinitsyn, Candidate of Technical Sciences; effect of joints between channels in triaxial gyro-stabilized platform: L. N. Slezkin, Engineer; theoretical proposal for the possible design of a generalized gyro instrument: M. M. Bogdanovich, Docent, Candidate of Technical Sciences; problem of drift in a power-type triaxial gyro stabilizer: V. N. Karpov, Engineer; methods of modeling random disturbances in gyro systems: S. S. Shishman, Senior Engineer; method of noise functions for investigating a system subjected to random

Card 2/3

SCIENTIFIC-TECHNICAL CONFERENCE [Cont'd] S/146/63/006/002/010/010

signals: G. P. Molotkov, Docent, Candidate of Technical Sciences; drifts in a gyro-stabilized platform as a result of the effect of cross joints under determined and random disturbances: B. I. Nazarov, Docent, Candidate of Technical Sciences; stability and natural oscillations in inhomogeneously rigid gyro systems with backlash under external influences: S. A. Chernikov; methods of designing a gyro vertical with automatic latitude and course corrections: A. V. Til', Candidate of Technical Sciences; use of asymptotic methods in solving problems of the motion of an astatic gyroscope in gymbol suspension: D. M. Klimov, Candidate of Physical and Mathematical Sciences, and L. N. Slezkin; theory of aperiodic gyro pendula: V. S. Mochalin, Docent, Candidate of Technical Sciences; and selecting basic parameters of course gyros by using nomograms: V. P. Demidenko, Engineer. [AS]

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L 18231-65 EEC-2/EWT(d)/EEC(k)-2/EEC(t)/EED-2 Pn-4/Po-4/Pq-4/Pg-4/Pae-2/Pk-4/
P1-4 AFWL BC

ACCESSION NR: AP4048295 S/0146/64/007/005/0094/0101

AUTHOR: Karpov, V. N.

TITLE: Dynamics of a three-axis gyro stabilizer

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 5, 1964, 94-101

TOPIC TAGS: gyroscope stabilizer, gyrostabilized platform

ABSTRACT: A 3-axis gyro stabilizer with three 2-degrees-of-freedom integrating gyro units (see Enclosure 1) is theoretically considered; Oxyz is the coordinate system connected with the gyrostabilized platform and $O\xi_i\eta_i\zeta_i$ is the coordinate system connected with the i-M gyro unit (i = 1, 2, 3). Equations of motion of the gyro stabilizer are set up; their analysis shows that the stabilizer can be regarded as a 3-channel automatic-control system with linear and nonlinear cross couplings between the channels. The effects of cross couplings upon the accuracy of stabilization of the gyrostabilized platform in the inertial space under perturbed

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L 18231-65

ACCESSION NR: AP4048295

conditions and upon the platform drift due to the system dynamics are investigated. It is found that: (1) The linear cross couplings bring about increased error in each channel; (2) On application of a harmonic disturbance even to one of the axes, the platform drifts with respect to the inertial space; (3) Under oscillatory conditions in the channels, the oscillations may get synchronized through the cross couplings which may aggravate the platform drift; (4) The platform drift due to the system dynamics can be cut by a proper selection of regulators and oscillation parameters. Orig. art. has: 3 figures and 25 formulas.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Fine Mechanics and Optics)

SUBMITTED: 11May63 ENCL: 01

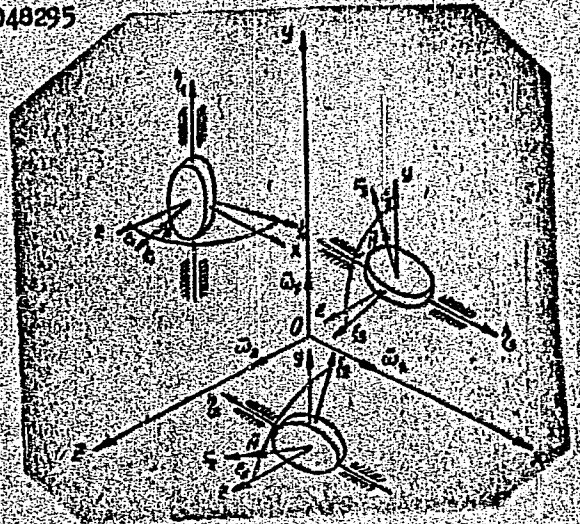
SUB CODE: NG NO REF SOV: 004 OTHER: 001

Card 2/3

L 18231-65

ACCESSION NR: AP4048295

ENCLOSURE: 01



A 3-axis gyroscopic stabilizer

Card 3/3

KARPOV, V.N.

Improving the electrical equipment of the MP-21 screw press. Masl.-zhir.prom.21 no.6:30-31 '55. (MLRA 8:12)

1. Kirovabodskiy masloshirkombinat
(Electric motors)

L 32054-66 EWP(e)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG/AT/AH

ACC NR: AP6013348 SOURCE CODE: UR/0363/66/002/004/0683/0687

41
B

AUTHOR: Rode, Ye. Ya.; Karpov, V.N

ORG: Institute of General and Inorganic Chemistry im. N.S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Phase diagram of the system WO_3—Nd_2O_3

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 4, 1966, 683-687

TOPIC TAGS: tungsten compound, neodymium compound, tungstate, phase diagram

ABSTRACT: The phase diagram of the WO_3—Nd_2O_3 system was constructed (see Fig. 1) from heating curves of annealed mixtures of initial components of various compositions. Cooling and reheating curves of the latter were also considered. X-ray phase analysis of both the pure compounds formed and their mixtures confirmed the diagram obtained. In addition to the normal neodymium tungstate $Nd_2(WO_4)_3$ and 1:1 oxytungstate Nd_4WO_6 described earlier, three more compounds were found to form in this system: 1:2 oxytungstate $Nd_2W_2O_9$, 2:1 oxytungstate Nd_4WO_9, and 3:1 oxytungstate Nd_8WO_{12}. M P. Sokolova participated in the experimental part. The authors thank V. G. Kuznetsov for his attention and interest in this work. Orig. art. has: 1 fig. and 1 table.

SUB CODE: 07, 11 / SUBM DATE: 11Jun65 / ORIG REF: 001 / OTH REF: 016

UDC 546.786+546.657

Card 1/2

L 32054-66

ACC NR: AP6013348

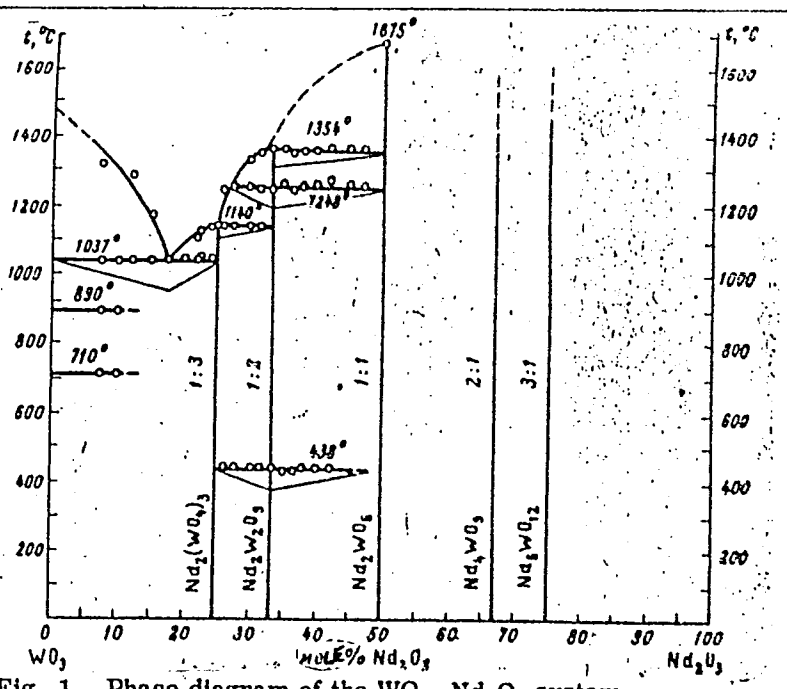


Fig. 1. Phase diagram of the WO_3—Nd_2O_3 system

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L 32055-66 EWP(e)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG/AT/WH

ACC NR: AP6013349 SOURCE CODE: UR/0363/66/002/004/0688/0692

AUTHOR: Rode, Ye. Ya.; Karpov, V. N.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Phase diagram of the system $Nd_2(WO_4)_3$-Na_2WO_4

SOURCE: AN SSSR Izvestiya. Neorganicheskiye materialy, v. 2, no. 4, 1966, 688-692

TOPIC TAGS: neodymium compound, tungstate, phase diagram

ABSTRACT: The phase diagram of the $Nd_2(WO_4)_3$-Na_2WO_4 system was constructed (see fig. 1) by plotting the heating curves of annealed mixtures of initial components of various compositions. Cooling and reheating curves of the latter were also taken into account. The diagram and the characteristics of the phases formed were confirmed by x-ray phase analysis of the pure compounds formed and their mixtures. The diagram showed that only two compounds, $NaNd(WO_4)_2$ (1:1 compound) and $Na_5Nd(WO_4)_4$ (5:1 compound), are formed in this system. The 1:1 compound melts at 1263C and forms solid solutions (probably substitutional ones) with neodymium tungstate. The 5:1 compound melts incongruently at 735C; with sodium tungstate, it forms a eutectic close in composition to the ordinate Na_2O_4 with a melting point of 686C. It is suggested that the addition of sodium tungstate to a rare earth tungstate orders the structure of the latter. On the basis of the diagram obtained, the crystallization of $Na_5Nd(WO_4)_4$ from Na_2WO_4 melt was

Card 1/3 UDC 546.657'786+546.33'786

L 32055-66

ACC NR: AP6013349

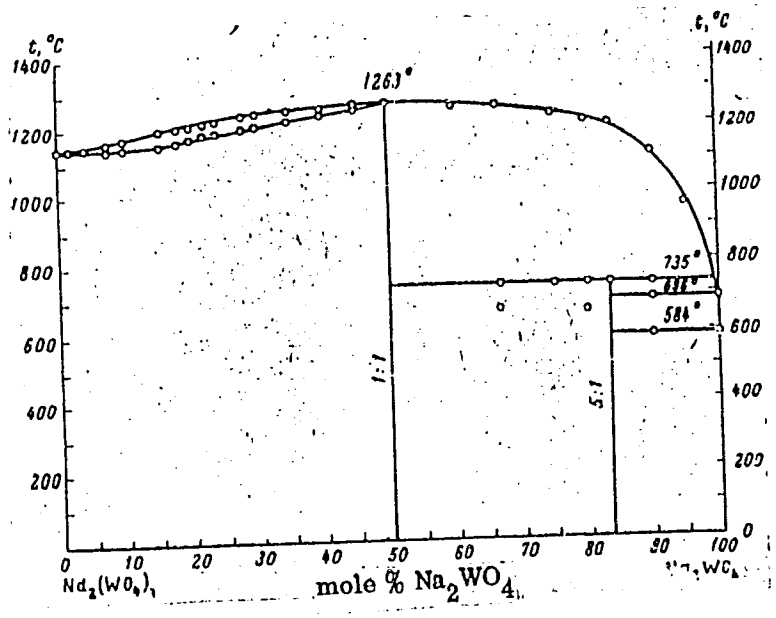

Figure 1. Phase diagram of the $Nd_2(WO_4)_3$-Na_2WO_4 system

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L 32055-66

ACC NR: AP6013349

carried out at 720—680C. M. P. Sokolova participated in the experimental part of the work. The authors thank V. G. Andrianov and A. I. Gusev, of the Moscow Institute of Fine Chemical Technology im. M. V. Lomonosov (Moskovskiy institut tonkoy khimicheskoy tekhnologii), for assistance in carrying out the x-ray phase analysis of the system studied, and A. A. Yeliseyev, on the staff of IONKh AN SSSR im. N. S. Kurnakov, who took an active part in the discussion of the results. Orig. art. has: 1 figure and 1 table.

SUB CODE: 07 / SUBM DATE: 11Sep65 / OTH REF: 010

Card 3/3

L 09312-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG
ACC NR: AP6029830 SOURCE CODE: UR/0363/66/002/008/1527/1528

AUTHOR: Rode, Yo. Ya.; Karpov, V. N.

ORG: Instituto of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences, SSSR (Institut obshchoy i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Phase diagrams of the systems Na_2WO_4-$SrWO_4$ and $Na_2W_2O_7$-$SrWO_4$

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 8, 1966, 1527-1528

TOPIC TAGS: strontium compound, sodium compound, tungstate, phase diagram, X ray analysis

ABSTRACT: The phase diagram of the Na_2WO_4-$SrWO_4$ system was obtained from heating curves of annealed mixtures of the initial components present in various proportions (see Fig. 1). Cooling and reheating curves were also taken into account. X-ray phase analysis of both the initial pure compounds and annealed mixtures was used to confirm the diagram. From the latter it follows that no compounds are formed in this system, and that the system has a degenerate eutectic whose composition and melting point are close to those of sodium tungstate. A similar phase diagram of the $Na_2W_2O_7$-$SrWO_4$ system (see Fig. 2) also showed the presence of a degenerate eutectic. Pure Na_2WO_4 and $Na_2W_2O_7$ as well as eutectics formed by these compounds with $SrWO_4$ solidify with considerable supercooling. Orig. art. has: 2 figures.

Card 1/3 UDC: 541.123.2

L 09312-67
ACC NR: AP6029830

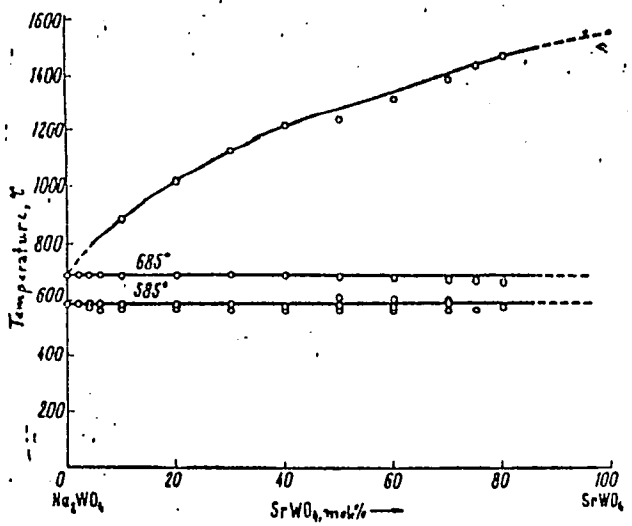

Fig. 1. Phase diagram of the Na_2WO_4-$SrWO_4$ system

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L 09312-67
ACC NR: AP6029830

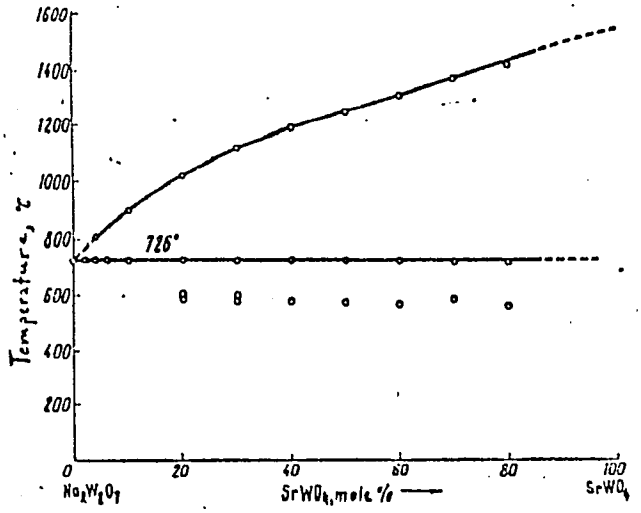

Fig. 2. Phase diagram of the $Na_2W_2O_7$-$SrWO_4$ system

SUB CODE: 11,07/ SUBM DATE: 02Dec65/ OTH REF: 002

Card 3/3

TOLMACHEVA,Z.M.; KARPOV,V.P.; OPRITOVA,L.A.

Suggestions by efficiency workers of the Saratov furniture plant.
Der.prom.4 no.6:29-30 Je '55. (MLRA 8:10)
(Saratov--Furniture industry)

SUVOROVA, Nina Petrovna; RODENDORF, B.B., ovt.red.; MESSNER, O.M., red.izd-va; KARPOV, V.P., tekhn.red.

[Cambrian trilobites from the eastern part of the Siberian Platform] Trilobity kembriia vostoka Sibirskoi platformy. Moskva, Izd-vo Akad. nauk SSSR. No. 2 [Olenellids - granulariids] Olenellidy - granuliariidy. 1960. 238 p. (Akademiia nauk SSSR. Paleontologicheskii institut. Trudy, vol.84). (MIRA 13:12)

(Siberian Platform--Trilobites)

KARPOV, V.P.

Combustion
SOV/113-58-11-14/16

AUTHOR: Gershman, I.I., Candidate of Technical Sciences

TITLE: A Conference on the Combustion and Carburation in Compressed-Ignition Engines (Konferentsiya po sgoraniyu i smeseobrazovaniyu v dvigatelyakh s vosplamenen iyem ot szhatiya)

PERIODICAL: Avtomobil'naya promyshlennost', 1958, Nr 11, pp 43 - 45, (USSR)

ABSTRACT: The manifold problems involved with an increase in the liter capacity in diesel engines by, e.g. an increase in rpm, were the subject of the conference on the combustion and carburation in diesel engines convoked by the AS USSR in June 1958. The conference was attended by representatives of 78 research and training institutions and enterprises of the USSR, and by guests from the Satellite countries. A total of 30 papers and communications previously given to the attendants for study were discussed. Theoretical problems of the physical phenomena of the processes within automobile and other combustion engines were treated by Academician B.S. Stechkin, Professor A.S. Sokolik, Candidates of Technical Sciences A.I. Serbinov and Yu.B. Sviridov. R.M. Mokhov was concerned with problems of the cetane number. The paper of Prof. A.S. Sokolik and V.P. Karpov dealt with the pre-combustion chamber fuel-spray ignition principle, and

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A Conference on the Combustion and Carburation in Compressed-Ignition Engines

its practical application. Candidate of Technical Sciences L.A. Gusak denied the decisive role of the speed and temperature of the stream leaving the prechamber. Several papers were devoted to the motion of the air in the combustion chamber. A.S. Sokolik and Ye.S. Semenov have conducted research on a single-cylinder engine and measured the changes in speed of cyclic currents by aid of an electro-thermoanemometer. The vortex spinning around the cylinder axis was considered by Candidate of Technical Sciences V.Ye. Mazing. Candidate of Technical Sciences M.S. Khovakh presented the calculatory and analytical characteristic of the motion of the air in the turbulence chamber. The ETA-5A electrothermoanemometer for measuring the pulsation speed of a gas flow was designed by P.V. Chebyshev in the Vsesoyuznyy energeticheskiy institut imeni Lenina (All-Union Power Institute imeni Lenin) several years ago, and now has been supplemented by a device permitting the determination of the turbulence characteristic of gas motion including temperature and pressure influences. This device was designed by Ye. S. Semenov. Candidate of Technical Sciences N.N. Ivanchenko reported on research work in the Tsentral'nyy nauchno-

A Conference on the Combustion and Carburation in Compressed-Ignition Engines

issledovatel'skiy dizel'nyy institut (Central Scientific Diesel Research Institute) on an improvement of the operation process of engines with cylinders of 230 and 180 mm diameter, having the combustion chamber in the crown of the piston. The problem of noxious fumes developing in the combustion process and possible ways to their removal was treated by A.S. Sokolik and supplemented by material presented by the Prague Automobile Institute that is especially concerned with research in this particular field. Doctor of Technical Sciences A.N. Voinov spoke about the process of combustion from compression and from the heated surface of a homogenous mixture. The paper of Correspondent Member of the AS USSR, N.R. Briling dealt with work on the creation of a short-stroke, fast-speed DB-engine. Candidate of Technical Sciences A.S. Khachiyan considered the possibility of controlling the injection principle by way of a design selection of the elasticity magnitude of the pump and nozzle drive, as was checked in the testing of the DB-67 engine. Candidate of Technical Sciences S.I. Kuptsov has worked out a hydraulic fuel feed system for the DB engine, which simplifies the design. Professor D.N. Vyrubov sketched still open problems

A Conference on the Combustion and Carburation in Compressed-Ignition Engines

concerning the oxygen feed to the superconcentrated mixture. Professor M.A. Khaylov investigated several aspects of heat liberation and also stressed the necessity of creating high-quality measuring devices. Doctor of Technical Sciences M.D. Apashev demonstrated the process of combustion in an engine with a transparent cylinder in a plane-parallel flow, taken by him with a rapid-motion film camera. A.P. Mironov showed a film on the process of fuel injection into a turbulence chamber of cylindrical shape with transparent side walls. The conference concluded that despite great progress in the concepts on the nature of combustion in diesel engines, the developmental requirements of the diesel engine-building sector have not yet been adequately covered. The establishment of a permanent research group on these problems in Moscow, a union of the scientific and technical

A Conference on the Combustion and Carburation in Compressed-Ignition Engines

specialists dealing with engines, publication of a scientific and technical journal on internal-combustion engines, and publication of the papers delivered at this conference were agreed upon.

ASSOCIATION: NAMI

1. Internal combustion engines 2. Scientific reports

Card 5/5

SHERSTNYAKOV, V.F.; KARPOV, V.P.

Two methods for solving the equations of the flow of bubble point oil. Nauch.-tekh. sbor. po dob. nefti no.16:8-13 '62. (MIRA 15:9)

1. Vsesoyuznyy neftegazovyy nauchno-issledovatel'skiy institut.
(Oil reservoir engineering)

KARPOV, V.P. (Odessa)

Treatment of children suffering from cerebral spastic paralysis in an Odessa children's sanatorium. Vrach. delo no.9:153-154 '63. (MIRA 16:10)

1. Detskiy sanatoriy "Khadzhibey".
(CEREBRAL PALSY)

USSR/Engineering
Fuels - Analysis
Engines - Combustion

Sep 1947

KARPOV, V. P.

"An Analysis of the Conditions for Thermal Combustion of Fuel Mixtures in Engine Cylinders," Prof V. P. Karpov, 3 pp

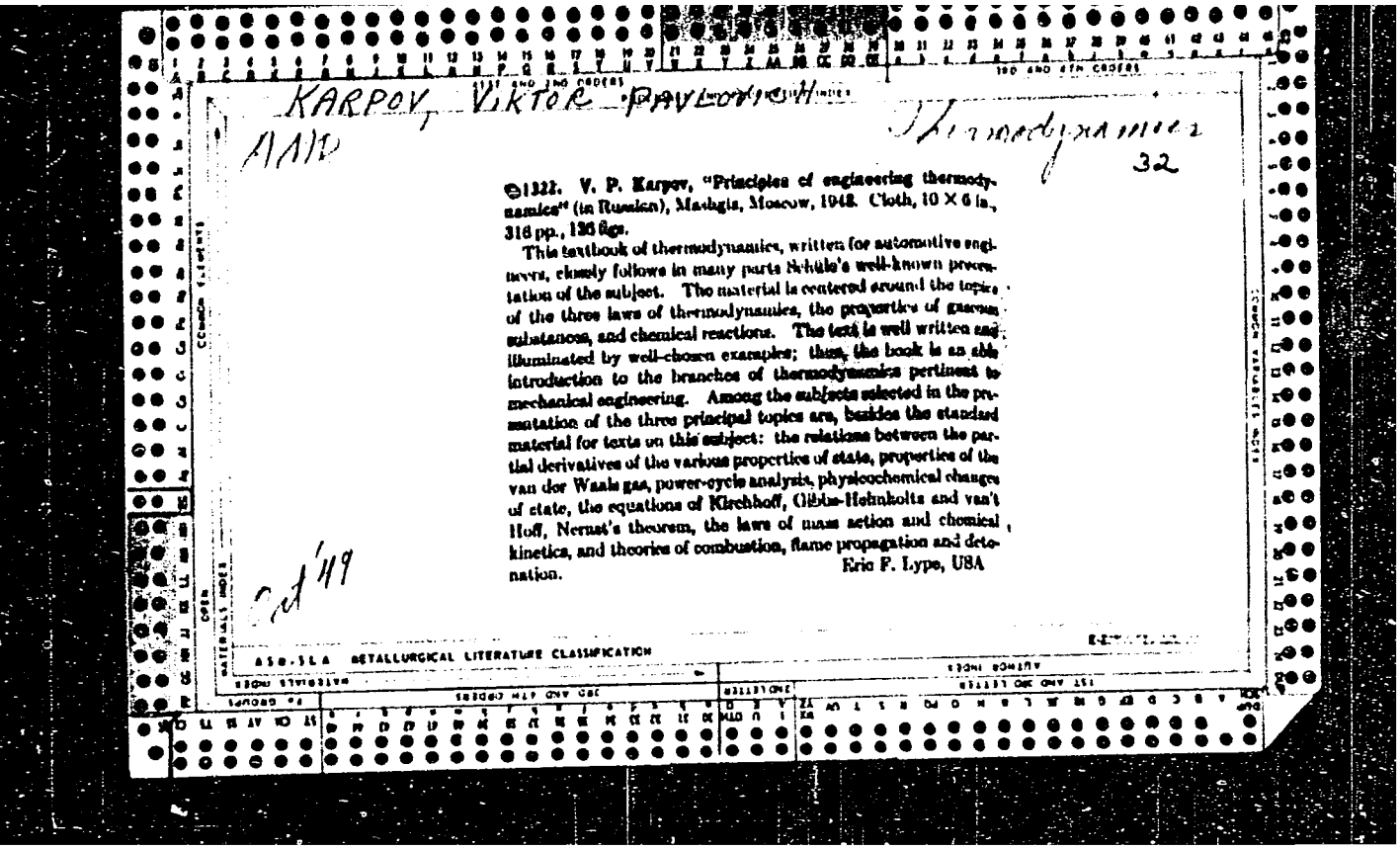
"Avtomobil'naya Promyshlennost'" No 9

Premature combustion of the fuel gases is a defect of internal combustion engines, which very frequently results in fires. It must be remembered that the generation and duration of the reaction of combustion depends on the heat exchange of the products of the reaction as well as the surrounding matter. Graphs showing the results of calculation on the basis of mathematical formula and a table of results showing pressures, temperatures and reaction time.

23754

USSR/Engineering (Contd) Sep 1947
Fuels - Analysis
Engines - Combustion

23754



KARPOV, Viktor Pavlovich

Thermodynamics

32

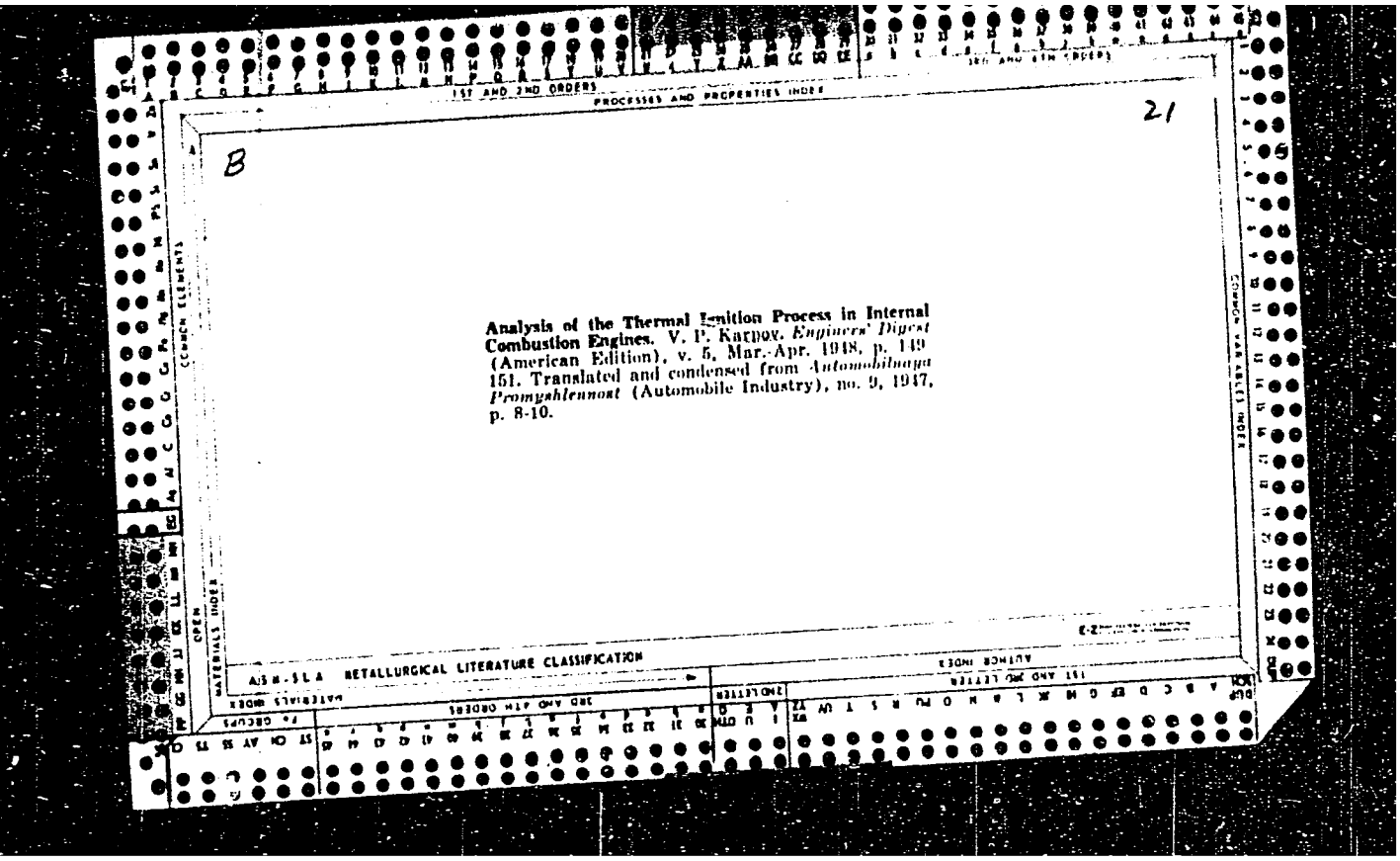
©1322. V. P. Karpov, "Principles of engineering thermodynamics" (in Russian), Mashgiz, Moscow, 1948. Cloth, 10 × 6 in., 316 pp., 126 figs.

This textbook of thermodynamics, written for automotive engineers, closely follows in many parts Schüle's well-known presentation of the subject. The material is centered around the topics of the three laws of thermodynamics, the properties of gaseous substances, and chemical reactions. The text is well written and illuminated by well-chosen examples; thus, the book is an able introduction to the branches of thermodynamics pertinent to mechanical engineering. Among the subjects selected in the presentation of the three principal topics are, besides the standard material for texts on this subject: the relations between the partial derivatives of the various properties of state, properties of the van der Waals gas, power-cycle analysis, physicochemical changes of state, the equations of Kirchhoff, Gibbs-Helmholtz and van't Hoff, Nernst's theorem, the laws of mass action and chemical kinetics, and theories of combustion, flame propagation and detonation.

Eric P. Lype, USA

Cal '49

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



B

21

Analysis of the Thermal Ignition Process in Internal Combustion Engines. V. P. Karpov. *Engineers' Digest* (American Edition), v. 5, Mar.-Apr. 1948, p. 149-151. Translated and condensed from *Automobilnaya Promyshlennost* (Automobile Industry), no. 9, 1947, p. 8-10.

KARPOV, V. P.

Gorenie Gazooraznyky Smesei v Dvigateliakh (Combustion of Gas Mixtures in Internal Combustion Engines), 119 p., Moscow, 1951.

KARPOV, V. P.

"Dealt with the antechamber torch ignition as basis of a new type of engines"

report presented at the conference on Combustion and Formation of the Mixture in Diesel Engines, convened by the Motor Laboratory, Acad. Sci. USSR, Moscow 10-12 June 1958.
(Vest. Ak Nauk SSSR, 1958, No. 9, 115-117)

5 (4) 11.1000

66430

AUTHORS: Karpov, V. P., Semenov, Ye. S., Sokolik, A. S. SOV/20-128-6-35/63

TITLE: Turbulent Combustion in a Closed Space

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 6, pp 1220 - 1223 (USSR)

ABSTRACT: In the authors' Association it has been endeavored since 1950 (Ref 1) to develop a method for the determination of the combustion rate in a turbulent gas flow. The result of this work was the apparatus shown in figure 1, a nearly spherical tank in which the gas was stirred to turbulent motion by agitators driven by electric motors. Ignition was by an electric spark in the tank center, the pressure was measured and recorded by means of piezo quartz. Through two parallel glass panes the propagation of the flame could be filmed by means of a schlieren apparatus (Fig 2). As can be seen from figure 3, the pressure in the turbulent flame remains lower than in the laminar flame. The intensity $|U'|$ of the turbulence was measured at various distances from the center by means of a compensated electrothermoanemometer of the type ETA 5A. The analysis of the oscillogram showed that high-frequency pulses were superimposed to

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the $|U'|$, which amounted to $(\bar{u}'^2)^{1/2}$ with respect to the turbulent diffusion. For the entire turbulence U'_Σ therefore $U'_\Sigma = \left\{|\bar{U}'|^2 + \bar{u}'^2\right\}^{1/2}$. It is shown in figure 4 that the rate U_T of turbulent combustion increases linearly with the intensity of the turbulence: $U_T = a.U'_\Sigma + b$, where coefficient a lies between 1 and 2 for low temperatures. There are 4 figures and 5 references, 2 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemicophysics of the Academy of Sciences, USSR)

PRESENTED: June 11, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: June 5, 1959

66498

~~5(4)~~ 11.1000 SOV/20-129-1-46/64

AUTHORS: Sokolik, A. S., Karpov, V. P.

TITLE: The Dependence of the Rate of Turbulent Burning on the Laminar Rate and Temperature of Burning

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 168-171 (USSR)

ABSTRACT: The two concepts of the mechanism of turbulent burning are analyzed: the model of laminar surface burning, and the concept of the turbulent flame as the propagation of a pulsating three-dimensional reaction (Refs 5-7). By reason of experiments with hydrogen - air mixtures it is proved that there is no direct connection between the rate U_T of turbulent and the rate U_L of laminar burning, and that U_T increases with rising temperature. The fundamental difference between the propagation of the flame in the range of constant values of U_T and at decreasing U_T is shown by means of moving-picture filming of the flames (Fig 3). When U_T decreases propagation becomes nonuniform. The latter is caused by a decrease in the reaction rate due to a change in the

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